

Split Passive HRM-V™ Energy Recovery Heat Pipes

ENGINEERING SPECIFICATIONS

Site or Factory Installed Energy Recovery Heat Pipes

HRM-V™ Model with Modulating Control Valves

1. GENERAL

Air Handler(s) Packaged Air Conditioning Equipment shall be equipped with Energy Recovery Heat Pipes supplied by Heat Pipe Technology, Inc. to transfer heat from the exhaust air to the incoming supply air. Supply and Exhaust heat pipe sections are separated horizontally a few feet on the same level or separated horizontally and vertically as specified.

2. CONSTRUCTION

Coil tubes shall be oriented vertical and the fins run horizontal. Each two rows shall be manifolded together into one liquid line at bottom and one gas line at top and constitute one circuit. Lines shall be sized according to the performance requirements of the circuit. Each heat pipe section shall be installed level and connected to the other section by two horizontal copper lines, for each circuit, one for liquid and one for vapor.

3. OPTIONAL MODULATING CONTROL VALVE FEATURE

All or a portion [SPECIFY] of the Heat Pipe circuits shall be equipped with modulating control valves to control the operation of the Heat Pipe circuits. Each circuit shall have one modulating step motor valve in the lower liquid line in an accessible location, between the two coils. Each valve will connect to a control printed circuit board in a NEMA box which also houses a 24 VAC transformer. Multiple circuit installations will have the several control boards in one NEMA box. The customer supplied electrical power to the control panel power supply transformer shall be: 120 VAC 208 VAC 230 VAC 1 phase 60 Hz. The NEMA box shall be located on the exterior or interior surface of the equipment cabinet as indicated or on a nearby surface.

The Building Automation System shall provide the sensors necessary for determination of heat pipe modulation operation and the BAS computer shall be programmed to send the operating control signals to the modulating valves' control boards as required for correct system operation. The control signal shall go through a BAS interface installed near the heat pipe NEMA box. The BAS control signal provided shall be 0 to 10 volt DC signal.

All additional wiring shall be provided and installed by others. With all control valves open, the energy recovery heat pipe assembly will operate at full capacity. Modulating one valve closed restricts the liquid return flow and reduces the heat transferred by the heat pipe until closing the valve shuts off that circuit. Frost control, if needed, is accomplished by closing or shutting off one or more circuits. Economizer operation is also accomplished by shutting off circuits to achieve desired heat transfer.

4. HEAT PIPES

- 1) The Heat Pipe supplier shall have a minimum of 5 years of experience designing, manufacturing, and installing Heat Pipes specifically for split energy recovery applications. Heat pipes must be manufactured and assembled at the heat pipe supplier's own facility by supplier's own staff.
- 2) The tubes shall be copper only, of specific design for Heat Pipe application, permanently expanded onto the fin collar to form a firm, rigid, and complete pressure contact at all operating conditions. Aluminum tubes will not be allowed.
- 3) The fin surface shall be continuous plate type aluminum or copper fins of specific design to produce maximum heat transfer efficiency for Heat Pipe applications. Airside pressure loss shall be as given on the schedule, or otherwise specified. Fin density and the number of rows of tubes shall be as specified.
- 4) The Heat Pipe modules shall have an optional protective coating of E-Coat, similar to Electrofin or phenolic, similar to Heresite. Heat pipes shall be dipped and completely submerged to insure full coverage of coating - spray coatings are not acceptable.
- 5) Heat transfer fluid shall be classified as Safety Group A1 in ASHRAE Standard 34-2013.
- 6) Heat Pipe capacities, entering and leaving dry and wet bulb temperatures, and face velocity shall be as specified.
- 7) The Heat Pipes shall be installed as specified.
- 8) Frames and mounting structure shall be minimum 16 gauge galvanized steel or stainless steel.
- 9) Heat Pipe interconnecting piping and circuitry shall be as specified by Heat Pipe Technology design. Each circuit shall be individually processed, charged, hermetically sealed, and tested.
- 10) The heat pipe system shall be pressure tested on site under the supervision of the manufacturer's crew. Manufacturer's crew shall vacuum and charge the system. Vacuuming and charging by parties other than the manufacturer's own crew shall not be acceptable.
- 11) Scheduled effectiveness or heat recovery shall be met at a minimum and total pressure drop shall not be exceeded. The resulting Recovery Efficiency Ratio, or RER, shall therefore be met at a minimum.
- 12) The Heat Pipes shall be ETL listed to UL standard 207 and CSA C22.2.140.3.
- 13) The Heat Pipe heat exchanger shall have a five (5) year limited warranty. All components such as valves and dampers shall carry a 12 month warranty.